

Steps To Great Production Potential

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No-Till and Cover Crops can benefit crop yields, water infiltration, overall soil health, fertilizer and chemical input costs, soil erosion, and the list keeps going. Together they are universal practices that can be used in all farming operations whether it is bottom ground, highly erodible, irrigated, or with livestock. The outcomes have been impressive to say the least.

One of the common concerns I have heard from producers is that the cover crop will take away the available soil moisture from the following cash crop. That may be, if they are not properly managed. **Cover crops use water from the soil while they are growing, but once killed, the residue may increase water availability by increasing infiltration and reducing evaporation losses.** Some producers that planted cover crops for the 2012 growing season thought they had made the worst decisions when the weather turned off record breaking hot and dry. When in fact once the dust settled from harvest, the yields proved them wrong.

On irrigated land especially, yields can be maximized during drought conditions and normal conditions, if no till and cover crops are used, **the residue will act like insulation keeping the ground cool and cut down on moisture lost from evaporation. I have read about average soybean yield bumps of 11 bushels an acre on irrigated bottom ground with cover crops and no till verses irrigated and no-till only.**

Another common statement I hear is that bottom ground needs to be opened up so that it can be dried out, planted timely, or to control weeds. Now I'll be the first to say I've never personally farmed a bottom field in my life, but I know the river bottom soils in Atchison and Holt Counties can be some of the most productive in Missouri. So what's currently being done can't be wrong, but what if we can make it better? It seems weather patterns are changing, when we get rain it's a major event. We want to make sure our soils can hold it, bank it so to speak and not run off. I have heard people say conventionally tilled irrigated bottom ground can't take more than a half inch through the pivot before it starts running off. Same soil, irrigated, and no tilled automatically has more water holding capacity, up to 2 inches even. Upright corn stalks help trap blowing snow, bring more useful moisture to your farm during the off season. **By leaving residue on the field and not tilling, you are building soil structure, increasing organic matter and water infiltration so that when we get a rain, the soil takes it in and stores it for good use. Working the soil gives you the immediate result you were looking for, but with no-till the long term results can't be beat.** You add cover crops, and that's helping the water go further into the soil profile, breaking up the compaction without using tillage implements, giving you an additional source of nitrogen, and as an added benefit helping suppress those chemical resistant weeds such as water hemp, pigweed and mares tail.

For those that have invested in subsurface drainage systems, no-till and cover crops can help you too. For most, these systems are to help drain soils that predominantly remain wet days after a rain which can prevent timely planting, and cause stress on growing crops. NRCS looks at these systems from a water quality aspect. If used properly they could help keep Nitrogen out of the water courses. Whichever the result you are looking for, less tillage and more biological activity should make the system function more efficiently from the benefits of water infiltration.

Number one reason for no-till and cover crops on Highly Erodible ground in Atchison and Holt Counties is soil erosion. We are blessed in this area with highly unique, very productive, deep forgiving soils. That is why every year more and more timbered draws and fence rows are being taken out to put into farm production. In order to stay in compliance with USDA, you are allowed up to two times the soil loss tolerance. For most soils in our area, that is the equivalent of 10 tons of soil loss an acre during a typical corn-soybean rotation. **My concern as a conservationist and an invested farmer myself is that any soil loss should be too much.** With land prices as they are, the ground and the soil is a major investment. We need to stop it from eroding away to places it's not welcome, and work on making it better and more profitable where it is

For those farmers that already juggle row crop and livestock, adding cover crops should be win-win all around with not much more management risk. **Let the ground work for you. Plan your cover crops to fit your system. They can be grazed any time after establishment, and the livestock is essentially recycling the nutrients and making them more readily available for the upcoming cash crop.**

There is no doubt that there are significant risks in farming today. Fertilizer, seed, fuel, and land costs are at historic highs. Weather patterns are extreme. There is a comfort level with traditional farming methods, and to make a change in a tillage operation or management system is just one more perceived high risk. I know this perception has many people reluctant to try a change. But farmers who do are seeing success at levels that even surprise them. The proof is there, these practices work for many different challenges farmers are facing.

Below is an approach for a Corn-Soybean farmer, interested in a no-till cropping system, that is low in risk, and will jump start nearly any soil type toward higher production with the possibility of less inputs:

Step 1: No-till a cereal rye cover crop into corn stalks - It's easy to establish and easy to kill. Cereal rye is one of the most versatile cover crops--It is very cold tolerant, one of the most tolerant species to residual corn herbicides, and can be seeded aerial, incorporated with a vertical tillage tool or drilled with a high rate of success. It can be mixed with other species such as daikon radish or rape depending on the seeding date and resource concerns.

Step 2: No-till a relatively early group soybean into cereal rye and try to plant these beans early in the planting season. Early group soybeans are more determinant, and benefit from early planting, plus this gives you a wider window to seed a cover crop mix next fall.

Soybeans respond well to the cereal rye environment, even when planted into tall cereal rye. Soybeans are not adversely affected by immobilized Nitrogen which can be associated with a high Carbon: Nitrogen cereal grain like rye. The soybeans respond favorably to rye which also gives you great weed control and late season water conservation. As you know during most Midwest summers an extra ½" to 1" of water in August or September will have a major benefit to soybean yields.

Step 3: Plant a low Carbon: Nitrogen cover crop mix after soybeans: Cover crops prior to corn should trap or produce Nitrogen in the fall and early spring, and then release Nitrogen at the optimum time in the spring/summer. Corn into a mix such as: Oat/Radish that winter kills, or cereal rye/crimson clover mix will capture or produce organic Nitrogen and release the N at time of greatest need.

Cereal grain cover crop ahead of corn may have a high N immobilization, which can limit plant available nitrogen for the corn crop. If cereal grain cover crops are the only available option due to other resource concerns (such as soil erosion), plan to terminate them in vegetative stage, utilize them in a mix with lower C: N cover crops like Austrian Winter Pea and/or compensate with extra N in starter fertilizer.

Step 4: No-till corn into the low C: N mix the following spring. By planting a cover crop mix with a low C: N ratio, N is released more timely and the corn crop also benefits from the timed release of the organic N. Remember that C:N is closely related to cover crop maturity, so plan to terminate the cover crop while it is in the vegetative stage.

By now, soil biological populations and processes are well on their way. Soil aggregates are stabilizing and pores are opening. Water infiltration and holding capacity are on the rise. Nutrients are cycling and accessible from alternate pathways.

Result...GREAT production potential!